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Description of a new subgenus and species of the fish genus *Congrogadus* Günther from Western Australia (Perciformes: Pseudochromidae)

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Abstract – *Congrogadus winterbottomi* is described from Middle Mangrove Island, West Pilbara Islands, and Exmouth Gulf in Western Australia. It is assigned to a new subgenus, *Pilbaraichthys*, which is distinguished from other congrogadine genera and subgenera by the following combination of characters: dorsal-fin rays I,57–61 (usually I,59 or I,60); anal-fin rays 47–50 (usually 48 or 49); pelvic fins and their girdles absent; dark spot on operculum, none on shoulder; gill membranes fused ventrally, with posterior margin free from isthmus; lateral line in single, short anterodorsal section; teeth in outer row of dentary and premaxilla 14–21; and cheek with short dark bar extending from posteroventral edge of eye (at about 5 o'clock position) towards lower (anterior) tip of preopercle.

INTRODUCTION

The Pseudochromidae is an Indo-Pacific family of small, reef-associated fishes. The family is currently divided into four subfamilies: Anisochrominae, Congrogadinae, Pseudochrominae and Pseudoplesiopinae (Godkin and Winterbottom, 1985; Gill, in press). Unlike the more or less perch-like members of the Anisochrominae, Pseudochrominae and Pseudoplesiopinae, commonly known as dottybacks, the Congrogadinae are eel-like in body form, and frequently called eelblennies. The Congrogadinae were revised by Winterbottom (1986), who recognised nine genera with 19 species. Three additional species, all from southern Oman, have been described since the publication of Winterbottom's revision, two by Winterbottom and Randall (1994) and one by Winterbottom (1996).

In May 1996, the present authors surveyed shore fishes from the West Pilbara Islands, Western Australia. Among the fishes collected was a single sample of a distinctive new congrogadine species of the genus *Congrogadus* Günther, 1862. A search of museum collections revealed an additional nine specimens, collected at several localities in Exmouth Gulf, Western Australia. We herein describe the new species and assign it to a new subgenus.

MATERIALS AND METHODS

Nomenclature of head pores follows Winterbottom (1986), except for the series of pores in the posterior temporal area (Figures 1–2): supracleithral (= "posterior temporal" or "posttemporal" of Winterbottom, 1986) in the supracleithrum just anterior to the first lateral-line scale; posttemporal (= "anterior temporal," in part, of Winterbottom, 1986) in the posttemporal; anterior temporal (= "anterior temporal," in part, of Winterbottom, 1986) between the junction of the posttemporal and the lateral extrascapula. This terminology permits homologous comparison of head pore patterns between and within pseudochromid subfamilies. Osteological details were determined from x-radiographs and two paratypes (in BMNH 1999.9.21.4-5) that were cleared and counter-stained for cartilage and bone following the methods of Potthoff (1984). Cranial length was measured following Godkin and Winterbottom (1985). Vertebral counts are presented in the form precaudal + caudal; the latter are defined as vertebrae bearing a haemal spine, and include the terminal urostylar complex. Terminology of ribs and intermuscular bones follows Gill (1998). Other methods of counting and measuring follow Winterbottom (1986). Institutional codes follow Leviton *et al.* (1985). Counts and measurements are given as values or value ranges for all type specimens, followed, where different, by values for the holotype in parentheses. Where counts were recorded bilaterally, both counts are presented for the holotype, separated by a slash; the first count given is the left count. Frequency

Table 1 Frequency distributions for selected meristic characters of *Congrogadus (Pilbaraichthys) winterbottomi*. * indicates characters for which bilateral counts are included.

	Segmented dorsal rays							Segmented anal rays					
	57	58	59	60	61	$\bar{x}$	S.D.	47	48	49	50	$\bar{x}$	S.D.
Middle Mangrove I.	1	2	13	4	–	59.0	0.7	2	12	5	1	48.3	0.7
Exmouth Gulf	–	1	1	5	2	59.9	0.9	1	–	6	2	49.0	0.9
Total	1	3	14	9	2	59.3	0.9	3	12	11	3	48.5	0.8

	Pectoral rays*				Precaudal Vertebrae			
	10	11	$\bar{x}$	S.D.	15	16	$\bar{x}$	S.D.
Middle Mangrove I.	37	5	10.1	0.3	12	10	15.5	0.5
Exmouth Gulf	18	–	10.0	0.0	4	5	15.6	0.5
Total	55	5	10.1	0.3	16	15	15.5	0.5

	Caudal Vertebrae					Total Vertebrae				
	48	49	50	$\bar{x}$	S.D.	63	64	65	$\bar{x}$	S.D.
Middle Mangrove I.	9	7	4	48.8	0.8	3	11	6	64.2	0.7
Exmouth Gulf	1	7	1	49.0	0.5	1	2	6	64.6	0.7
Total	10	14	5	48.9	0.7	4	13	12	64.3	0.7

	Tubed lateral line scales*											
	26	27	28	29	30	31	32	33	34	35	$\bar{x}$	S.D.
Middle Mangrove I.	1	3	3	6	14	5	4	3	3	1	30.3	2.1
Exmouth Gulf	1	–	1	2	6	4	2	–	2	–	30.4	1.9
Total	2	3	4	8	20	9	6	3	5	1	30.4	2.0

	Termination of lat. line (D. seg. ray)*						
	6	7	8	9	10	$\bar{x}$	S.D.
Middle Mangrove I.	3	20	14	3	1	7.5	0.8
Exmouth Gulf	–	8	8	2	1	7.7	0.7
Total	3	28	22	5	2	7.6	0.8

	Upper gill rakers						Lower gill rakers					
	1	2	3	4	$\bar{x}$	S.D.	9	10	11	12	$\bar{x}$	S.D.
Middle Mangrove I.	–	2	16	3	3.0	0.5	1	7	10	3	10.7	0.8
Exmouth Gulf	1	2	5	1	2.7	0.9	2	6	1	–	9.9	0.6
Total	1	4	21	4	2.9	0.6	3	13	11	3	10.5	0.8

	Total gill rakers								
	10	11	12	13	14	15	16	$\bar{x}$	S.D.
Middle Mangrove I.	–	–	2	7	8	2	2	13.8	1.1
Exmouth Gulf	1	–	3	4	–	1	–	12.6	1.3
Total	1	–	5	11	8	3	2	13.4	1.3

	Pseudobranch filaments						
	6	7	8	9	10	$\bar{x}$	S.D.
Middle Mangrove I.	–	3	9	6	2	8.4	0.9
Exmouth Gulf	2	2	5	–	–	7.3	0.9
Total	2	5	14	6	2	8.0	1.0

distributions for selected meristic characters are given in Table 1. Comparisons with other *Congrogadus* species are based on data provided by Godkin and Winterbottom (1985), Winterbottom (1980, 1986) and Winterbottom *et al.* (1984), and on the following specimens (all specimens preserved in alcohol, unless otherwise stated): *C. hierichthys*, BMNH 1933.3.11.727 (100.0 mm SL), BMNH 1933.3.11.728 (100.5 mm SL); *C. malayanus*, BMNH 1879.5.14.51 (61.0 mm SL); *C. spinifer*, BMNH 1911.1.4.3-4 (122 mm SL cleared and stained; 116.0 mm SL), BMNH 1933.8.11.5 (126.0 mm SL), BMNH 1933.8.14.18-21 (5: 57.5–87.5 mm SL); *C. subducens*, AMS I.26723-051 (49.3 mm SL cleared and stained), AMS I.26723-052 (18.7 mm SL cleared and stained), AMS I.26723-057 (135.0 mm SL cleared and stained), BMNH 1847.7.21.67-69 (ca. 147 mm SL cleared and stained), WAM P.31013-025 (183.0 mm SL).

SYSTEMATICS

Family Pseudochromidae Müller and Troschel, 1849

Subfamily Congrogadinae Günther, 1862

Genus *Congrogadus* Günther, 1862

Subgenus *Pilbaraichthys* nov.

Type Species

Congrogadus winterbottomi sp. nov.

Diagnosis

Pilbaraichthys is distinguished from other congrogadine genera and subgenera by the following combination of characters: dorsal-fin rays I,57–61 (usually I,59 or I,60); anal-fin rays 47–50 (usually 48 or 49); pelvic fins and their girdles absent; dark spot on operculum, none on shoulder; gill membranes fused ventrally, with posterior margin free from isthmus; lateral line in single, short anterodorsal section; teeth in outer row of dentary and premaxilla 14–21; and cheek with short dark bar extending from posteroventral edge of eye (at about 5 o'clock position) towards lower (anterior) tip of preopercle.

Relationships

The following external characters place *Pilbaraichthys* in the genus *Congrogadus* (see Winterbottom, 1986): no ocellated spot on shoulder (spot on operculum); unbranched caudal-fin rays absent; 57 or more segmented dorsal-fin rays; 47 or more anal-fin rays; and lateral line in a single, short anterodorsal section. The first two characters are autapomorphic for the genus. Godkin and Winterbottom (1985) listed six osteological autapomorphies for the genus: quadrate narrow (narrow in *Pilbaraichthys*; Figure 3); posterior extension of quadrate longer than plate-like portion (posterior extension considerably longer than plate-like portion in *Pilbaraichthys*; Figure 3); ectopterygoid extending well beyond posterior

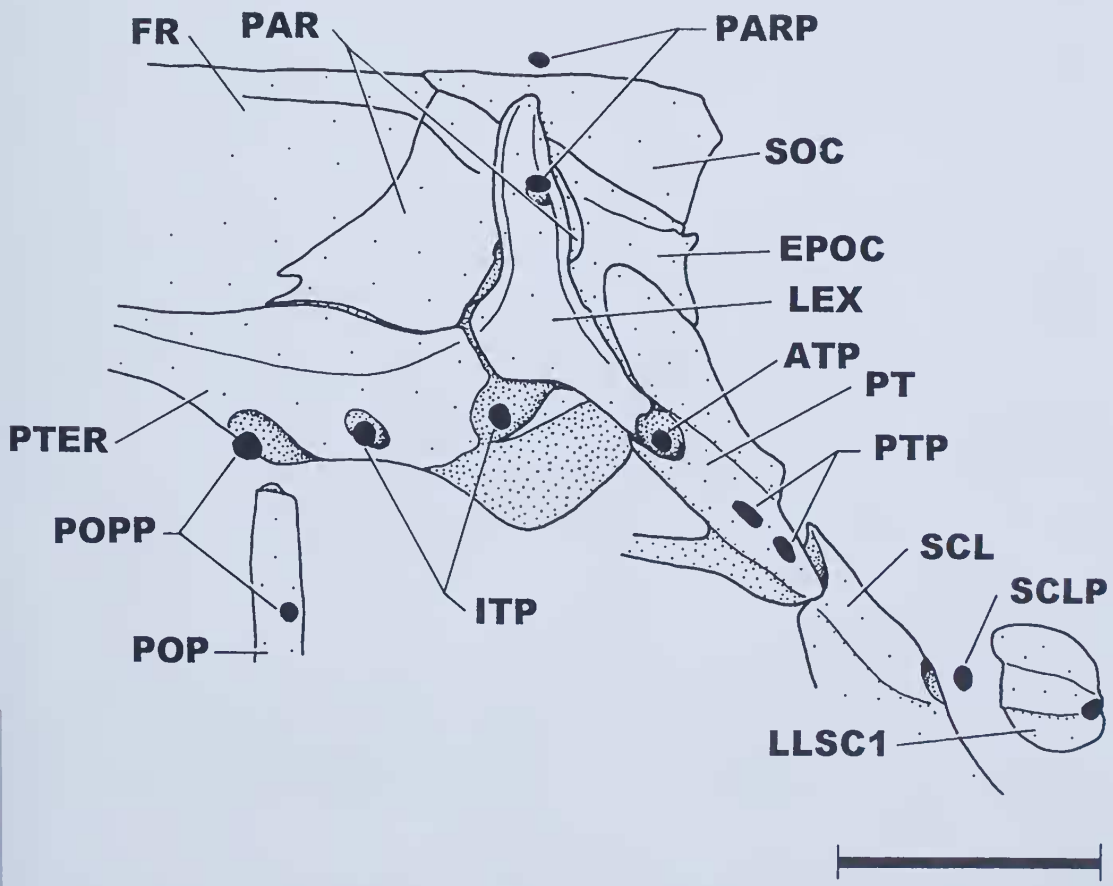

Figure 1 Posterior head pores (in black) and associated superficial osteology of *Congrogadus (Pilbaraichthys) winterbottomi*, BMNH 1999.9.21.4-5, 71.5 mm SL, paratype. (The presence of an anterior temporal and two posttemporal pores is exceptional for the species.) ATP, anterior temporal pore; EPOC, epioccipital; FR, frontal; ITP, intertemporal pores; LEX, lateral extrascapula; LLSC1, lateral-line scale 1; PAR, parietal; PARP, parietal pores; POP, preopercle; POPP, preopercular pores; PT, posttemporal; PTER, pterotic; PTP, posttemporal pores; SCL, supracleithrum; SCLP, supracleithral pore; SOC, supraoccipital. Scale bar = 1 mm.

margin of plate-like portion (present in *Pilbaraichthys*; Figure 3); dorsal head of symplectic double (double in *Pilbaraichthys*; Figure 3); coronoid process of angulo-articular (not of the dentary as incorrectly stated by Godkin and Winterbottom, 1985, pp. 662, 667; correctly illustrated, however, in their fig. 6B) bilobed (bilobed in *Pilbaraichthys*; Figure 3); and lower jaw length greater than 76% cranial length (79–95% in *Pilbaraichthys*).

Godkin and Winterbottom (1985) recognised two subgenera in *Congrogadus*, which had previously been considered separate genera: *Congrogadus*, with two species, *C. hierichthys* Jordan and Richardson 1908 from the Sulu Sea, Philippines, and *C. subducens* Günther 1862 from the West Pacific and eastern Indian Ocean; and *Congrogadoides* Borodin 1933, with three species, *C. amplimaculatus* (Winterbottom, 1980) from the Gulf of Carpentaria, Australia, *C. malayanus* (Weber, 1909) from the Aru Islands to Torres Strait, Australia, and *C. spinifer* (Borodin, 1933) from northwestern Australia.

Godkin and Winterbottom (1985) listed two synapomorphies to link the two species of the subgenus *Congrogadus*: medial swelling on palatine (absent in *Pilbaraichthys*; Figure 3); and lower jaw length greater than 94 % cranial length (79–95 % in *Pilbaraichthys*). Godkin and Winterbottom also noted that *Congrogadus* has numerous teeth on the premaxilla and dentary, the outer row teeth 18–40 and 19–43, respectively. The premaxillary and dentary teeth are less numerous in *Pilbaraichthys*, the outer row teeth 14–21 and 14–21, respectively. *Halimuraenoides* also has numerous premaxillary and dentary teeth, but assuming the relationships proposed by Godkin and Winterbottom are accurate, the condition is interpreted to be independently derived (and thus an autapomorphy of *Halimuraenoides* and of the subgenus *Congrogadus*).

Godkin and Winterbottom (1985) listed three synapomorphies linking the three species of the subgenus *Congrogadoides*: medial process on anterior head of maxilla with constricted waist (present in *Pilbaraichthys*; Figure 4); well-defined white spots on body (absent in *Pilbaraichthys*); and gill membranes fused ventrally to isthmus (free posteriorly from isthmus in *Pilbaraichthys*; Figure 2). Mooi *et al.* (1990) proposed an additional synapomorphy linking the three species of *Congrogadoides*: predominance of three-armed hooks

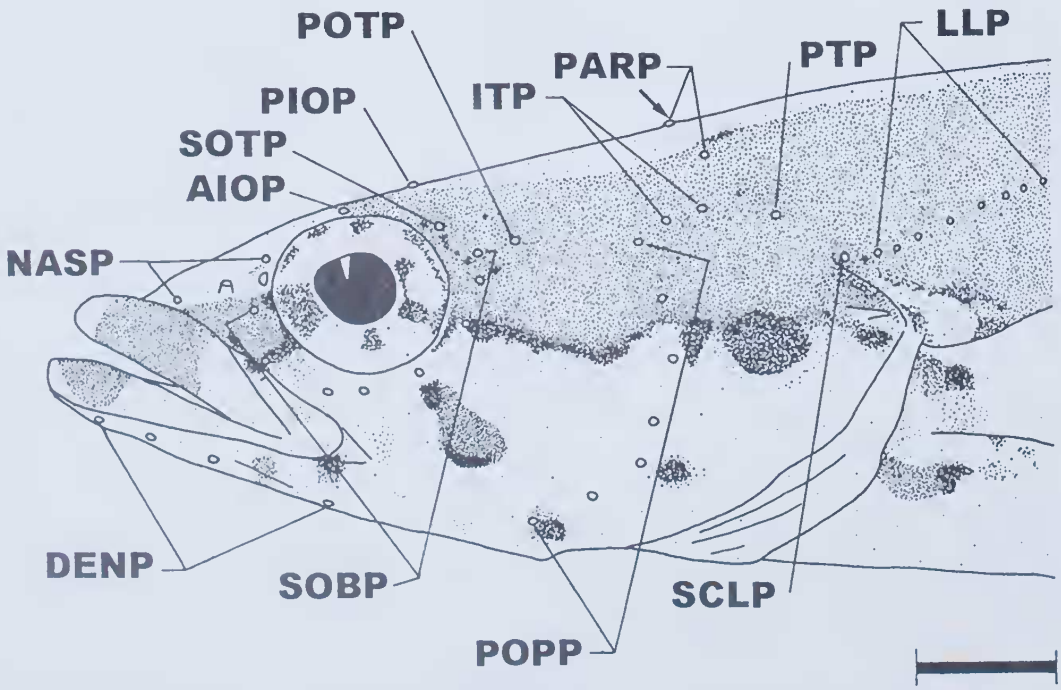

Figure 2 Cephalic pigmentation and cephalic sensory pores in *Congrogadus (Pilbaraichthys) winterbottomi*, WAM P.31582-001, 85.1 mm SL, holotype. AIOP, anterior interorbital pore; DENP, dentary pores; ITP, intertemporal pore; LLP, lateral-line scale pores; NASP, nasal pores; PARP, parietal pores; PIOP, posterior interorbital pore; POPP, preopercle pores; POTP, posterior otic pore; PTP, posttemporal pore; SCLP, supracleithral pore; SOBP, suborbital pores; SOTP, suprotic pore. Scale bar = 2 mm. Arrow indicates anterior extent of predorsal scales.

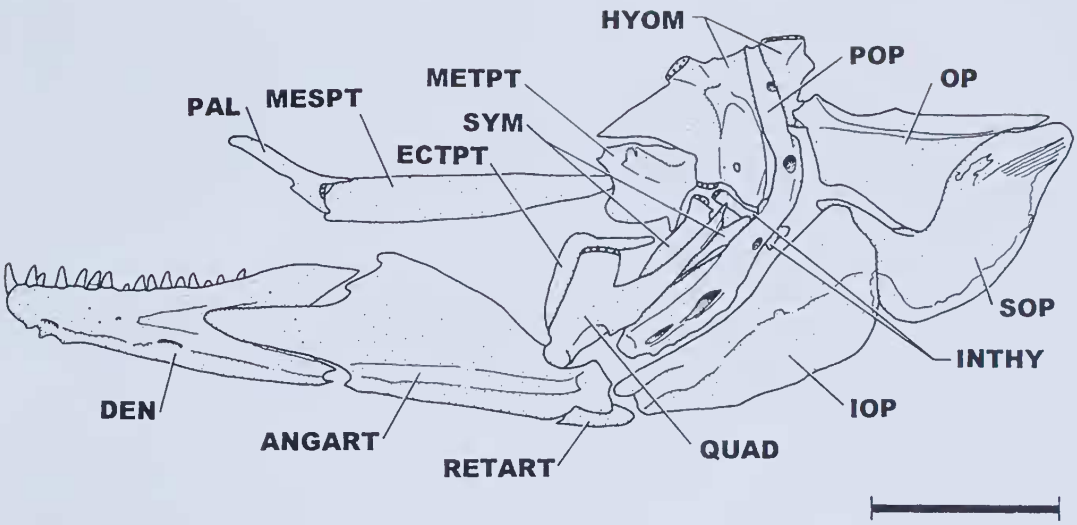

Figure 3 Lateral view of lower jaw and suspensorium in *Congrogadus (Pilbaraichthys) winterbottomi*, BMNH 1999.9.21.4-5, 71.5 mm SL, paratype, right side reversed. ANGART, angulo-articular; DEN, dentary; ECTPT, ectopterygoid; HYOM, hyomandibula; INTHY, interhyal; IOP, interopercle; MESPT, mesopterygoid; METPT, metapterygoid; OP, opercle; PAL, palatine; POP, preopercle; QUAD, quadrate; RETART, retro-articular; SOP, subopercle; SYM, symplectic. Cartilage shown in coarse stipple. Scale bar = 2 mm.

on egg surfaces. Unfortunately, however, we are unable to determine whether this character is present in *Pilbaraichthys*, as none of our specimens is gravid.

Thus *Pilbaraichthys* lacks all three autapomorphies of the subgenus *Congrogadus*, and possesses one of the four autapomorphies of the subgenus *Congrogadoides* (and we are unable to comment on one of the four autapomorphies, which involves egg-surface morphology). The presence in both of the medial process on anterior head of maxilla with constricted waist suggests a sister relationship between *Pilbaraichthys* and *Congrogadoides*. However, support for this relationship is weak, as Godkin and Winterbottom (1985) noted that among congrogadines the medial process on the anterior head of the maxilla has a constricted waist in *Haliophis* and in the subgenus *Congrogadus*, though to a lesser degree than that shown by *Congragadoides* (and by *Pilbaraichthys*).

A character suggesting a sister relationship between *Pilbaraichthys* and the subgenus *Congrogadus*, is the presence in both of a posterior otic pore (Figure 2), which is absent in

Table 2 Morphometric values for *Congrogadus (Pilbaraichthys) winterbottomi* expressed as a percentages of standard length (SL).

	Holotype	Paratypes					
mm SL	85.1	66.1–66.9	70.1–77.6	80.0–89.2	92.5–97.5	101.4–107.3	111.5–119.0
n		3	6	7	2	4	4
Soft dorsal-fin base	79.2	76.9–78.8	76.6–78.9	76.4–79.8	78.3–78.9	78.7–80.9	78.8–80.1
Anal-fin base	62.6	62.4–62.9	61.3–63.4	62.2–66.0	63.0–63.1	62.6–66.0	63.7–66.1
Snout to 1st dorsal	19.3	19.9–21.3	19.8–20.7	18.5–19.9	19.1–19.2	18.5–19.8	17.1–17.9
Snout to soft dorsal	20.7	21.1–22.8	21.4–22.7	19.6–20.9	20.5	19.8–20.6	18.7–19.4
Snout to anal origin	36.5	36.0–37.7	36.2–38.0	36.1–37.1	36.4–36.9	34.3–35.6	33.4–34.5
Head length	14.3	15.0–16.3	14.4–15.7	12.8–15.0	14.2–14.4	13.4–13.9	12.3–13.3
Depth at parietal	8.0	7.8–8.6	7.9–8.7	7.8–8.2	8.3	7.8–8.5	7.7–8.1
Depth at anal origin	10.1	9.4–10.6	9.4–10.7	10.1–11.0	10.9–11.1	9.4–10.9	9.0–10.3
Eye diameter	3.3	3.4–3.8	3.4–3.8	3.0–3.4	2.8–3.1	2.6–3.0	2.4–2.8
Snout length	3.6	3.7–4.1	3.4–3.9	3.3–3.8	3.6	3.2–3.6	3.2–3.4
Interorbital width	1.2	1.2–1.4	1.1–1.4	1.1–1.4	1.3	1.2–1.4	1.2–1.4
Upper jaw length	5.3	5.2–5.7	5.0–5.7	4.9–5.4	5.1–5.3	5.2–5.4	5.0–5.1
Lower jaw length	9.3	9.6–10.6	9.4–9.9	9.0–9.6	9.2–9.5	8.9–9.1	8.4–8.9
Pectoral length	5.3	5.7–5.8	5.4–5.8	5.0–5.6	5.6–5.8	5.3–5.9	5.5–5.9

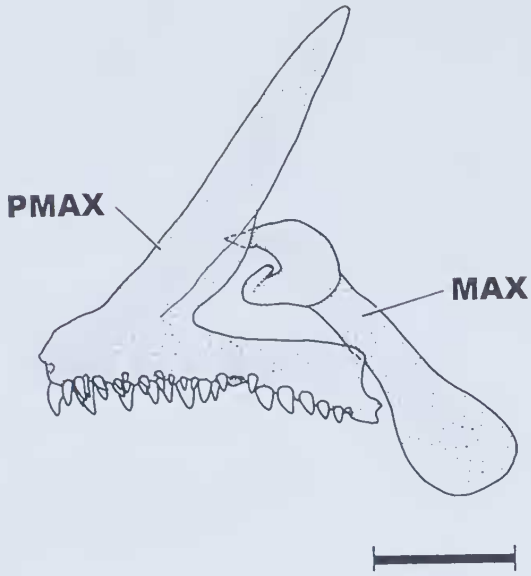

Figure 4 Medial view of right maxilla (MAX) and premaxilla (PMAX) in *Congrogadus (Pilbaraichthys) winterbottomi*, BMNH 1999.9.21.4-5, 71.5 mm SL, paratype. Dashed line shows outline of obscured portion of maxilla. Scale = 1 mm.

Congrogadoides. Among congrogadines a posterior otic pore is otherwise present only in *Halidesmus* and *Halimuraenoides*. However, it is also present in various other pseudochromids, including the immediate two outgroups to the Congrogadinae (Gill and Edwards, 1999). Based on the relationships proposed by Godkin and Winterbottom (1985), the presence of a posterior otic pore is considered to be apomorphic in the genus *Congrogadus*, and a potential synapomorphy between *Pilbaraichthys* and the subgenus *Congrogadus*.

Godkin and Winterbottom (1985: table 1) also indicated that *Congrogadoides* differs from *Congrogadus* in lacking a supraotic pore. However, this observation is erroneous, as all species of both subgenera have a supraotic pore (e.g., see Winterbottom, 1986). *Pilbaraichthys* also possesses a supraotic pore.

A character suggesting a relationship between *Pilbaraichthys* and *C. subducens* (type species of *Congrogadus*) to the exclusion of *C. hierichthys* is the usual presence of two intertemporal pores, one at the junction of the pterotic and the lateral extrascapula, and the other in the pterotic just behind the preopercular canal (Figures 1–2). However, this character provides, at best, weak support for a sister relationship between the two taxa, because occasional specimens of certain other congrogadine species (i.e., *C. malayanus*, *C. hierichthys*, *Halidesmus polytretus*, *Halimuraena hexagonata* and *Halimuraenoides isostigma*) may also have two intertemporal pores. The other character evidence noted above supporting a sister relationship between *C. subducens* and *C. hierichthys* likewise refutes a relationship between *Pilbaraichthys* and *C. subducens*.

Justification for erection of new subgenus

We have erected *Pilbaraichthys* because we lack convincing evidence to place *C. winterbottomi* in either of the other existing subgenera (the monophyly of both of which is supported by unique autapomorphies). Therefore, its inclusion in either subgenus would possibly render that subgenus paraphyletic (and, in the case of *Congrogadoides*, undiagnosed by external characters). Moreover, the erection of *Pilbaraichthys* will ultimately lead to greater nomenclatural stability because future phylogenetic work that allows resolution of a sister relationship for *C. winterbottomi* either to *Congrogadoides* or *Congrogadus* (the two opposing hypotheses suggested by current evidence) or to a clade consisting of both *Congrogadoides* and *Congrogadus* will not affect its subgeneric classification.

An alternative to the erection of *Pilbaraichthys* would be to discard subgeneric ranking within the genus *Congrogadus*. However, this classification would ignore the obvious morphological differences between *Congrogadus* and *Congrogadoides* (which, as noted above, had been regarded as separate genera prior to Godkin and Winterbottom, 1985) as well as the strong character support for their monophyly.

Etymology

A combination of "Pilbara" and the Greek "ichthys" (fish), alluding to its distribution along the south-western portion of the Pilbara district.

Congrogadus (Pilbaraichthys) winterbottomi sp. nov.

Pilbara Eelblenny
Figures 1–7, Tables 1–2

Holotype

WAM P.31582-001, 85.1 mm SL, Western Australia, Middle Mangrove Island, 21°29.260'S 115°21.955'E, tidal pool in limestone reef with *Sargassum* and mainly sand and mud bottom (very little coral), 0–0.4 m, R.D. Mooi, A.C. Gill and J.B. Hutchins, rotenone and dipnet, 10 May 1996 (field number RDM 96-10).

Paratypes

AMS I.39770-001, 2: 66.9–74.3 mm SL, collected with holotype; BMNH 1999.9.21.1-3, 3: 77.6–115.4 mm SL, collected with holotype; BMNH 1999.9.21.4-

Figure 5 *Congrogadus (Pilbaraichthys) winterbottomi*, WAM P.31582-001, 85.1 mm SL, holotype, Middle Mangrove Island, Western Australia. Photograph by P. Hurst.

5, 2: 71.5–84.5 mm SL (cleared and stained), collected with holotype; CSIRO H5237-01, 92.5 mm SL, collected with holotype; MPM 32574, 5: 61.3–101.8 mm SL, collected with holotype; NTM S.14970-001, 80.9 mm SL, collected with holotype; QM I.31415, 107.3 mm SL, collected with holotype; ROM 71992, 2: 85.3–107.0 mm SL, collected with holotype; SAMA F9302, 81.5 mm SL, collected with holotype; USNM 358035, 97.5 mm SL, collected with holotype; WAM P.31582-002, 2: 68.5–80.0 mm SL collected with holotype; WAM P.31017-022, 3: 71.8–115.7 mm SL, Exmouth Gulf, Tent Island, 21°59'S 114°30'E, rock pool, J.B. Hutchins and S.M. Morrison, rotenone, 18 August 1995; WAM P.31018-012, 4: 66.8–119.0 mm SL, Exmouth Gulf, 4 km N of Tubridgi Point, 21°50'S 114°39'E, rock pool, J.B. Hutchins and S.M. Morrison, rotenone, 19 August, 1995; WAM P.31013-046, 2: 66.1–111.5 mm SL, Exmouth Gulf, NW tip of Burnside Island, 22°06'S 114°31'E, rock pool, J.B. Hutchins and S.M. Morrison, rotenone, 16 August 1995.

Diagnosis

As for subgenus.

Description

Morphometrics (based on 85.1 mm SL holotype and 26 paratypes, 66.1–119.0 mm SL; Table 2): soft dorsal-fin base 76–81 (79) % SL; anal-fin base 61–66 (63) % SL; snout tip to origin of first dorsal fin 17–21 (19) % SL; snout tip to origin of soft dorsal fin 19–23 (21) % SL; snout tip to origin of anal fin 33–38 (37) % SL; head length (HL) 12–16 (14) % SL; head depth at parietal commissure 8–9 (8) % SL, 52–66 (56) % HL; body depth at anal-fin origin 9–11 (10) % SL, 61–80 (70) % HL; eye diameter 2–4 (3) % SL, 19–25 (23) % HL; snout length 3–4 (4) % SL, 23–27 (25) % HL; bony interorbital 1 % SL, 7–11 (8) % HL; upper jaw length 5–6 (5) % SL, 34–41 (37) % HL; lower jaw length 8–11 (9) % SL, 61–71 (65) % HL; pectoral-fin length 5–6 (5) % SL, 34–45 (37) % HL.

Dorsal fin I,57–61 (I,59), all segmented rays branched; anal fin 47–50 (48), all rays branched; pectoral fins 10–11 (10/10), upper and lower 0–1 ray unbranched, other rays branched (all rays branched in holotype); pelvic fins and girdle absent; caudal fin with five dorsal and five ventral branched rays, and no unbranched rays. Caudal fin fully connected by membrane to last ray of dorsal and anal fins. Vertebrae 15–16 + 48–50 = 63–65 (16 + 48); ribs present on precaudal vertebrae 3 through 5–6 (5); epineural bones present on precaudal vertebrae 1 through 4–6 (5). Caudal skeleton (Figure 6): epurals 1; parhypural without hypurapophysis, fused to hypurals 1 through 4 and to compound urostylar complex; hypural 5 absent. A_1 section of adductor mandibulae fused to A_2 section (similar to *C. subducens*, see Godkin and Winterbottom, 1985: fig. 2C).

Cephalic sensory pore openings (Figures 1–2; all pores bilateral unless otherwise indicated): nasal usually two, one pore just posterior to upper lip, second pore just above posterior nostril, third pore present unilaterally in three paratypes and bilaterally in one paratype in middle of nasal bone adjacent to anterior nostril; anterior interorbital usually one, pore absent unilaterally in three paratypes and two pores present unilaterally in one paratype; median (unpaired) posterior interorbital one; supraotic usually one, two pores unilaterally in two paratypes; posterior otic usually one, pore absent unilaterally in two paratypes; suborbital usually eight, nine unilaterally in two paratypes; preopercular usually seven, six unilaterally in two paratypes and eight unilaterally in one paratype; dentary usually four, three unilaterally in five paratypes; intertemporal usually two, one unilaterally in six paratypes, one bilaterally in one paratype; parietal one unpaired median pore and usually one paired lateral pore, two pores bilaterally in one paratype; anterior temporal usually absent, one unilaterally in one paratype, one bilaterally in one paratype; posttemporal usually one, two unilaterally in ten paratypes; supracleithral one.

Gill membranes fused together ventrally but free posteriorly from isthmus (Figure 2); branchiostegal rays 6; outer (anterior) gill rakers on first arch 1–4 + 9–12 = 10–16 (3 + 10); pseudobranch filaments 6–10 (9). Lateral line a single short section curving posterodorsally from shoulder, ending beneath segmented dorsal-fin ray 6–10 (8/9), and consisting of 26–35 (31/35) pored scales. Olfactory capsule with two openings; anterior opening a short tube,

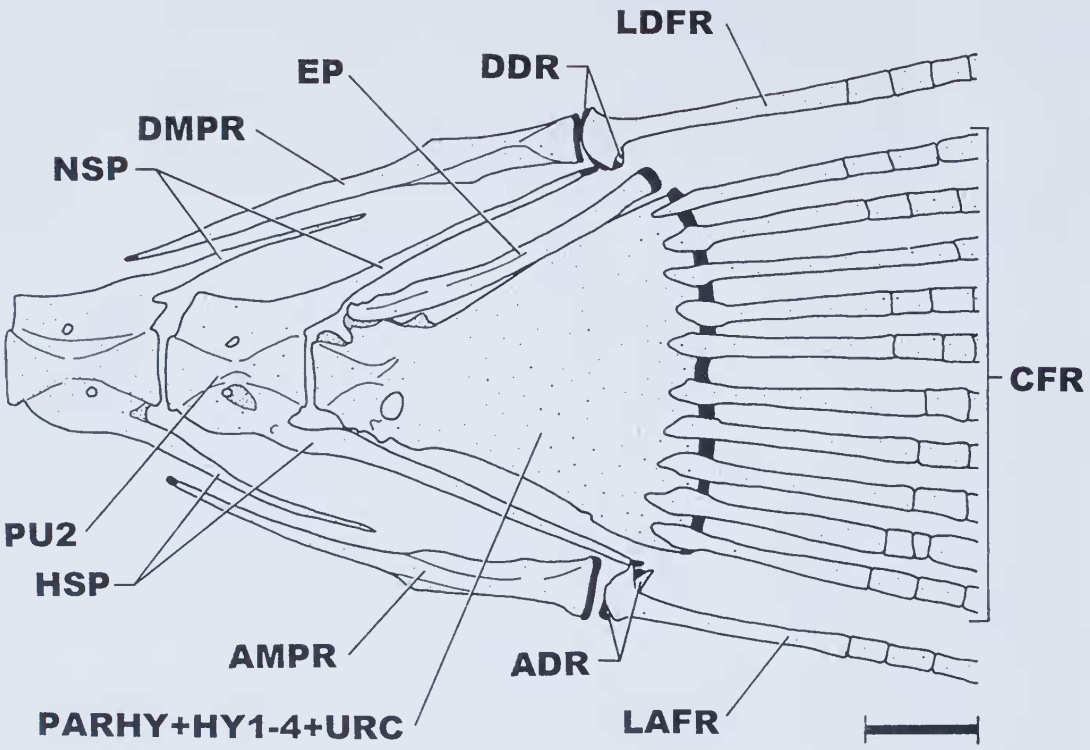

Figure 6 Left lateral view of caudal skeleton in *Congrogadus (Pilbaraichthys) winterbottomi*, BMNH 1999.9.21.4-5, 71.5 mm SL, paratype. ADR, anal distal radial; AMPR, fused anal middle and proximal radials; CFR, caudal-fin rays; DDR, dorsal distal radial; DMPR, fused dorsal middle and proximal radials; EP, epural; HSP, haemal spines; LAFR, last anal-fin ray; LDFR, last dorsal-fin ray; NSP, neural spines; PARHY+HY1-4+URC, fused parhypural, hypurals 1–4 and urostylar complex; PU2, preural centrum 2. Cartilage shown in black. Scale = 0.5 mm.

positioned about midway between posterior opening and edge of lip; posterior opening with slightly raised rim, positioned near anterodorsal rim of orbit (Figure 2). Cheek, upper edge of opercle (above horizontal through opercular spine) and body with small cycloid scales; predorsal scales extending anteriorly to parietal commissure (Figure 2). Teeth in outer row of premaxilla and dentary conical, recurved anteriorly, with one or two anterior teeth enlarged, caniniform and laterally displaced in large (greater than about 100 mm SL) specimens; teeth in outer row of premaxilla and dentary decreasing in size and becoming laterally compressed posteriorly, numbering 14–21; one to three inner rows of small conical teeth present anteriorly on premaxilla and dentary; vomer with a single row of about five small conical teeth arranged in a chevron; palatine edentate.

Live coloration (based on colour transparency of 101.8 mm SL paratype, MPM 32574, when freshly dead): body and upper part of head mottled brown; large (slightly larger than pupil) dark grey spot on upper part of operculum, broadly edged ventrally in pale yellow to white; irregular dark grey-brown stripe extending from behind eye to dark spot on operculum, edged narrowly along ventral edge with pale blue to white; lower part of head immediately below stripe abruptly pale bluish to greenish brown, becoming yellowish brown anteriorly; short dark grey-brown bar extending from posteroventral edge of eye (at about 5 o'clock position) toward lower (anterior) tip of preopercle, edged with pale blue or green to white; diffuse dusky brown stripe extending from anterior edge of eye to anterior part of upper lip; diffuse dusky brown stripe extending from posterodorsal edge of eye towards nape; small dark grey spot on lower part of operculum; lower part of head flecked with irregular pale blue to pale green markings; iris red, cream distally, with reddish brown to dark brown spots around perimeter; body mottling forming about 22 irregular dark bars; small dark grey spot on pectoral-fin base adjacent to third to sixth rays, broadly edged ventrally and dorsally with cream;

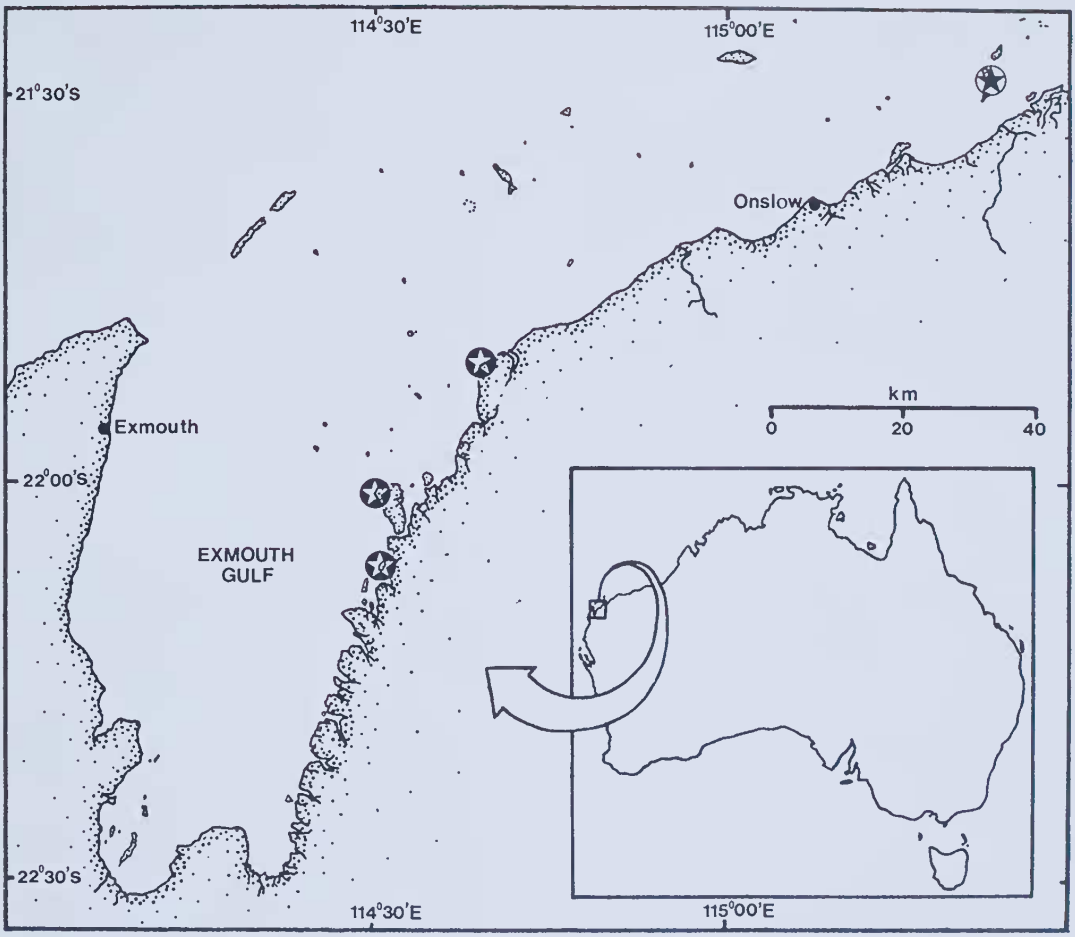

Figure 7 Collection localities for *Congrogadus (Pilbaraichthys) winterbottomi*. Black inset star indicates type locality (Middle Mangrove Island).

dorsal, anal and caudal fins yellowish to brownish hyaline, fin rays yellow or green to brown; dorsal and anal fins with basal row of reddish spots anteriorly, increasing to about six or seven rows posteriorly, these aligning to form oblique stripes, which converge on caudal fin; pectoral fin yellowish brown.

Preserved coloration: similar to live colour pattern; dark spot on operculum prominent, becoming dark grey-brown to black; dark bars and stripes extending from posterior, posterodorsal and posteroventral edges of eye prominent, becoming dark grey-brown to black; several dark grey-brown to black spots variably present on lower part of head and on breast; dark spot on pectoral base remaining, becoming dark grey-brown to black; dark mottling on body variable, ranging from indistinct in pale specimens to distinct in dark specimens, number of dark bars varying from about 20 to 27; dark spots on dorsal, anal and caudal fins usually distinct, ranging from grey-brown to black.

Comparisons

Congrogadus winterbottomi superficially resembles *C. subducens* in general coloration and body shape; we initially identified our material of *C. winterbottomi* as *C. subducens*. However, in addition to the characters noted above in the subgeneric relationships section, *C. winterbottomi* is readily distinguished from *C. subducens* in having a dorsal-fin spine (versus spine absent), segmented dorsal-fin rays 57–61 (versus 68–79; mistakenly stated as 68–74 by Winterbottom, 1986: 15), segmented anal-fin rays 46–50 (versus 57–66), and vertebrae 15–16 + 48–50 = 63–65 (versus 17–18 + 57–67 = 74–84). Moreover, the distinctive head coloration, particularly the pattern of dark lines radiating from the lower edge of the eye, readily distinguishes *C.*

winterbottomi from *C. subducens* and all other congrogadine species.

Habitat and distribution

Congrogadus winterbottomi has been collected only from muddy rock pools at Middle Mangrove Island (type locality) and Exmouth Gulf (Figure 7). Despite sampling in similar habitat, it was not collected farther offshore during the West Pilbara Island survey, nor in comprehensive collections made by the third author and associates farther to the south (Ningaloo Reef and Shark Bay) and north (Dampier Archipelago and the Kimberley coast). Narrow distributions such as this are not unusual for pseudochromids, with several confined to the northwestern Australian coast. For example, *Assiculoides desmonotus* Gill and Hutchins 1997 is known only from the north Kimberley coast (Gill and Hutchins, 1997; Hutchins, 1999).

The Exmouth Gulf and Middle Mangrove Island specimens of *C. winterbottomi* differ slightly in several meristic characters (Table 1). In particular, the Exmouth Gulf specimens have modally one more dorsal- and anal-fin ray, one more vertebra, and one fewer lower raker on the outer surface of the first gill arch, and a lower average number of pseudobranch filaments. However, these apparent differences may reflect the small sample sizes, and we therefore have chosen not to recognise them taxonomically.

Remarks

Congrogadus subducens was collected in two of the rotenone stations with *C. winterbottomi*, one specimen at Middle Mangrove Island in 1996, and two specimens at Burnside Island in 1995. An additional eight specimens of *C. subducens* were collected at the latter locality during the 1996 survey, but no further specimens of *C. winterbottomi* were taken.

Etymology

The specific epithet is for our colleague and friend Rick Winterbottom, in recognition of his important contributions to the systematics and biogeography of congrogadines and other fishes and in appreciation of the support and encouragement he has given us.

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